

REMARKS

The Office Action mailed April 19, 2006, has been carefully considered. In response, the application has been amended in a manner that is considered to place it into consideration for allowance. Accordingly, reconsideration and withdrawal of the outstanding Office Action and issuance of a Notice of Allowance are respectfully solicited in view of the foregoing amendments and the following remarks.

The Applicant respectfully submits that the claim amendments overcome the claim objections.

Claims 1, 2, 9, 11, 12, 33, 40, and 42-46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,377,652 (*Sturm*) in view of U.S. Patent No. 6,456,691 (*Takahashi, et al.*). Claims 3, 4, 10, 17, 20-24, 28, 34, 35, 41, 61-64, 68, 70, and 71 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patent to *Sturm* and *Takahashi, et al.* and further in view of U.S. Patent No. 4,047,029 (*Allport*). Claims 5-7, 13-16, 18, 19, 25-27, 36-38, 49-58, and 65-67 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patent to *Sturm, Takahashi, et al.*, and *Allport, et al.* in view U.S. Patent No. 6,178,226 (*Hell, et al.*). Claims 8, 29, 39, and 69 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patents to *Sturm* and *Takahashi, et al.*, *Allport, et al.*, and *Hell, et al.* in view of U.S. Patent Application Publication No. 2002/015020(*Yokhin*). Claims 30, 31, 72, and 73 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,442,233 (*Grodzins, et al.*) in view of the patent to *Takahashi, et al.*). Claims 32 and 74 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patents to *Grodzins, et al.* and *Takahashi, et al.* and further in view of U.S. Patent No. 4,152,591 (*Averitt, et al.*). Claims 33, 47, 48, 72, and 75 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No.

2002/0141535 (*Torai, et al.*) in view of the patent to *Takahashi, et al.* Claims 49, 59, and 60 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patent to *Torai, et al.* in view of the patents to *Takahashi, et al.* and *Yokhin*. Claims 76-79 are rejected over U.S. Patent No. 2,798,177 (*Wideroe*) in view of the patent to *Takahashi, et al.* Claims 80-82 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,598,451 (*Ohno, et al.*) in view of the patent to *Takahashi, et al.* Claims 80 and 83 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,280,513 (*Meltzer*) in view of the patent to *Takahashi, et al.* Claims 84 and 85 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patents to *Meltzer* and *Takahashi, et al.* and further in view of U.S. Patent No. 6,252,930 (*MacKenzie*). Claims 86-89 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2004/0218714 (*Faust*) in view of the patents to *Takahashi, et al.* and *Averitt*. Claim 90 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the patents to *Faust, Takahashi, et al.*, and *Averitt* and further in view of U.S. Patent No. 5,410,575 (*Uhm*). Claims 91-93 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patents to *Faust, Takahashi, et al.*, and *Averitt* and further in view of U.S. Patent No. 5,430,787 (*Norton*). Claims 91 and 94 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the patents to *Faust, Takahashi, et al.*, and *Averitt* and further in view of U.S. Patent No. 5,202,932 (*Cambier, et al.*). The grounds for the rejections are set forth on pages 4-23.

The Applicant respectfully traverses all of the above grounds of rejection. As will be explained below, none of the combinations of references applied in the Office Action would have resulted in, taught, or suggested the present claimed invention.

The Examiner has reiterated his previous rejections of the claims and has added arguments on page 3 of the Office Action that the cold cathode of *Takahashi et al* is “controlled to emit the electrons such that the beam of radiation emitted by the target is necessarily stabilized....” In support, the Examiner cites the description of the first embodiment in column 4, lines 50-53, and column 5, lines 8-14.

In response, the Applicant respectfully submits that, even if *Takahashi et al* is taken to teach stabilization of the beam of radiation, the present claimed invention offers advantages which a person having ordinary skill in the art would not have appreciated from the references, such as improved ability to detect substances which could not be detected by the prior art, so that the combinations of references proposed by the Examiner would not have been obvious. In particular, with regard to the claims reciting modulation, the Applicant respectfully reemphasizes the previously identified technical incompatibilities between *Takahashi et al* and *Hell et al*.

The Examiner relies on the following passages in the *Takahashi et al* patent:

1. Column 4, line 50: "The takeoff electrode potential is controlled so as to regulate an emitter-emitting electron current (i.e., tube current). The takeoff electrode 18 potential is ordinarily set positive based on the cathode 14 potential to regulate the tube current, while in some cases it may be set negative to restrain the tube current."

The Applicant respectfully submits that the above excerpt from *Takahashi et al* does not teach feedback control to stabilize the beam current, as in the present invention. Furthermore, it is not enabling because a person skilled in the art would take this statement to mean that the “electrode potential” is maintained, or controlled, at some fixed value, via any one of numerous means known in the art to control a voltage. In fact, the figure to which this excerpt refers to, Figure 1, shows all voltages being set at fixed values indicated by the conventional symbol for a

battery or fixed voltage source, items 46, 44 and 42 of Figure 1. The Applicant's assertion is that fixing these voltages does not regulate the electron current. This electrode potential must be dynamically changed according to the command of a feedback loop in which the "beam current" is the quantity being controlled and the electrode potential is the "control signal." To persons skilled in the art of control sciences, a "control signal" is entirely different from the thing that is being controlled. The control signal is the agent of control, not the thing being controlled. Therefore, *Takahashi et al* is not enabling and the description, supported by Figure 1, does not teach anything that would in fact work as stated in this patent. A fixed electrode potential, again as shown in Figure 1 items 46, 44 and 42, would not respond to changes in the beam current in any way to bring about stabilization of the beam current.

The patent examiner furthermore relies on wording in *Takahashi et al* in column 5 lines 9 through 18, "It is required in the X-ray generator"

However, that paragraph again teaches the use of fixed voltages that do not and cannot regulate the beam current:

Excerpted from line 11: "to control independently the Wehnelt 12 potential and the takeoff electrode 18 potential with the use of the second power supply 44 and the third power supply 46 respectively."

These fixed power supplies do not provide control action for the beam current. They may be themselves "controlled" so as to maintain their own voltage in a stable manner, but this does not stabilize the beam current.

Therefore, the Applicant respectfully submits that the invention fills a long felt need in the art and that no combination of the applied references would have resulted in, taught,

motivated, or even vaguely suggested the solution to that need provided by the present claimed invention.

For the reasons set forth above, the Applicant respectfully submits that the application as amended is in condition for allowance. Notice of such allowance is respectfully solicited.

In the event there are any questions relating to this Amendment or to the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

Please charge any deficiency in fees, or credit any overpayment thereof, to the account of Blank Rome, LLP, Deposit Account No. 23-2185 (000049-00110). In the event that a Petition for Extension of Time is required to render the present Amendment timely and either does not accompany the present Amendment or does not suffice to render the present Amendment timely, the Applicant respectfully petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render the present Amendment timely. Any fee due is authorized above.

~~Respectfully submitted,~~

By: 

David J. Edmondson
Reg. No. 35,126
Attorney for Applicant

Blank Rome LLP
Watergate
600 New Hampshire Avenue, N.W.
Suite 1100
Washington, D.C. 20037-2485
Telephone 202-772-5800
Facsimile 202-572-8398